

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A display apparatus for displaying an image, the display apparatus comprising:

a matrix display device comprising a plurality of pixels having electrodes, an optical state of each pixel being defined by particles moving in a fluid between the electrodes dependent on ~~a drive voltage having parameters including~~ selected from at least one of a value of the a drive voltage, a polarity of the drive voltage, and a duration of the drive voltage in a drive period during which the drive voltage is present across the electrodes of the pixel;

a driver for supplying a sequence of the drive voltages across the electrodes of the pixel during corresponding successive drive periods, ~~wherein each of the sequence of the~~ drive voltages ~~are~~ is applied according to input image data that produces the displayed image; and

a DC-balancing circuit comprising a controller for ~~providing image retention reducing compensation to the sequence of drive voltages by~~ adjusting at least one of the drive voltage parameters, for determining a time-average value of the drive voltages for the pixel, and for ~~obtaining a substantially zero value of the time-average value of the drive voltage~~

for consecutive fields of the pixel is adjusted substantially to zero while the pixel is being driven according to the input image data that produces the displayed image,

wherein the ~~controller adjusts the drive voltage parameters~~ are adjusted in steps corresponding to sub-fields of the field of the pixel.

2. (Currently amended) The display apparatus as claimed in claim 1, wherein the DC-balancing circuit further comprises a memory, and wherein the controller is adapted for

~~summing updating and storing~~ in the memory, ~~for the drive period of each pixel, a number indicating a multiplication~~ a running total of a product of the duration of said drive period and the value of the drive voltage supplied during said drive period to ~~said each pixel~~ during each drive period, and

adapting ~~the value of the~~ at least one of the value of the drive voltage and the duration of the drive period to obtain ~~a value of the number being~~ the running total as near-to zero as possible, the ~~number~~ running total corresponding to the time-average value.

3. (Currently amended) The display apparatus as claimed in claim 1, further comprising: a control circuit for driving the matrix display device in a sub-field mode wherein grey scales corresponding to the sub-field of each pixel are determined by a ~~number~~ plurality of sub-fields receiving the drive voltage during the corresponding field, and wherein the drive period is the duration of the ~~number~~ plurality of sub-fields receiving the drive voltage.

4. (Currently amended) The display apparatus as claimed in claim 2, wherein the controller is adapted for comparing an absolute value of the number-running total with a threshold ~~number~~ to supply a reset pulse to the pixel when an absolute value of the number-running total for the pixel surpasses the threshold ~~number~~.

5. (Currently amended) The display apparatus as claimed in claim 2, wherein the display device further comprises: a temperature sensor for sensing a temperature of the pixel, and wherein the controller is further adapted for modifying the number-running total dependent on the temperature.

6. (Currently amended) The display apparatus as claimed in claim 2, wherein the controller is adapted for modifying the number-running total non-linearly dependent on the value of the drive voltage.

7. (Currently amended) The display apparatus as claimed in claim ~~1~~ 2, wherein ~~a desired coloration of the pixel, after an initial period of time required to obtain the~~ a desired coloration of the pixel, the desired coloration is substantially independent ~~on~~ from the duration of the drive period, and wherein the controller is adapted for controlling the duration of the drive period to be longer than the initial period when the number-running total indicates that a polarity of the drive voltage is opposite to a plurality of an initial drive voltage corresponding to the initial period.

8. (Currently amended) The display apparatus as claimed in claim 7, wherein the controller is adapted for controlling the duration of the drive period not to exceed the initial period when the initial period causes the number-running total to change sign.

9. (Currently amended) The display apparatus as claimed in claim 42, wherein ~~a desired coloration of the pixel, after an initial period of time required to obtain the~~ a desired coloration of the pixel, the desired coloration is substantially independent ~~on~~ from the duration of the drive period, and wherein the controller is adapted for controlling the duration of the drive period to be substantially identical to the initial period when the number-running total indicates that a polarity of the drive voltage is the same as a plurality of an initial drive voltage corresponding to the initial period.

10. (Previously presented) The display apparatus as claimed in claim 7, wherein the display device is an electrophoretic display, and wherein the pixel comprises two switching electrodes and a further electrode, the driver being adapted for supplying the sequence of drive voltages to the two switching electrodes and the further electrode controlling intermediate optical states of the pixel.

11. (Previously presented) The display apparatus as claimed in claim 7, wherein the display device is an electrophoretic display, and wherein the pixel comprises at least two electrodes, and wherein the driver is adapted for supplying the sequence of drive voltages between the at least two electrodes for setting a grey scale of the pixel by providing a drive

voltage lower than a usually applied drive voltage which sets a grey level by modulating the duration of the drive period during which the usually applied drive voltage is present.

12. (Previously presented) The display apparatus as claimed in claim 1, wherein the display device is an electrophoretic display.

13. (Currently amended) A method of displaying an image by driving a matrix display device comprising a plurality of pixels, an optical state of each pixel being defined by particles moving in a fluid between electrodes dependent on ~~a drive voltage having~~ parameters including a value of ~~the a~~ a drive voltage, a polarity of the drive voltage and a duration of ~~the drive voltage in a~~ drive period during which the drive voltage is present across the electrodes of the pixel, the method comprising acts of:

supplying a sequence of the drive voltages across the electrodes of each pixel during corresponding successive drive periods, ~~wherein~~ each of the sequence of drive voltages are applied according to input image data that produces the displayed image;

~~providing image retention reducing compensation to the sequence of drive voltages by adjusting at least one of the drive voltage parameters; determining to set~~ a time-average value of the drive voltage for the pixel; and for obtaining a substantially zero value ~~of a~~ time-average value of the drive voltage across the pixel while the pixel is being driven according to the input image data that produces the displayed image,

wherein the time-average value is based on a product of the value of the drive voltage and the duration of the drive ~~voltage period~~ period in a corresponding drive period of a

previous consecutive field of the pixel, and ~~wherein the drive voltage parameters are~~ adjusted in steps corresponding to sub-fields of the field of the pixel that produces the displayed image.

14. (Currently amended) A display apparatus for displaying a plurality of images, the display apparatus comprising:

a matrix display device comprising a plurality of pixels having electrodes, an optical state of each pixel being defined by particles moving in a fluid between the electrodes dependent on ~~a drive voltage having parameters including selected from at least one of a~~ value of ~~the~~ a drive voltage, a polarity of the drive voltage, and a duration ~~of the drive voltage in a drive period during which the drive voltage is present across~~ the electrodes of the pixel;

a driver for supplying a sequence of the drive voltages across the electrodes of the pixel during corresponding successive drive periods, ~~wherein each of the sequence of the~~ drive voltages ~~are~~ is applied according to input image data that produces one of the plurality of displayed images; and

a DC-balancing circuit comprising a controller for ~~providing image retention reducing compensation to the sequence of drive voltages by adjusting at least one of the drive voltage parameters, for determining to set~~ a time-average value for each pixel, ~~used to~~ adjust at least one of the value of the drive voltage applied during a subsequent sub-field drive period and a duration of the subsequent sub-field drive period while the pixel is being driven by subsequent input image data that produces a subsequent one of the plurality of

displayed images, to compensate for the drive voltage applied during a previous sub-field drive period and a duration of the previous sub-field drive period while the pixel is being driven by previous input image data that produces a previous one of the plurality of displayed images to obtain a substantially zero ~~value of the time-average value~~ for each consecutive field of the pixel,

wherein the ~~controller adjusts the drive voltage parameters~~ are adjusted in steps corresponding to sub-fields of the field of the pixel.